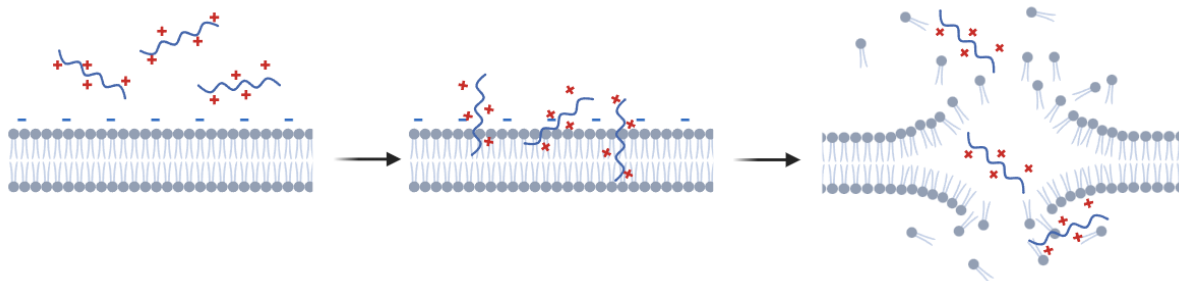


## Study of cell membrane lipid composition alterations as a mechanism of bacterial adaptation

*KATEDRA CHEMII I TECHNOLOGII POLIMERÓW, WYDZIAŁ CHEMICZNY PW*

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Antibiotic resistance is considered to be one of the main public health threats. In recent years, we have seen the emergence of bacterial strains resistant to membrane-targeting last-resort antimicrobials like daptomycin and colistin. Those resistant microbes often exhibit alterations to their cell membrane composition. Synthetic mimics of antimicrobial peptides, eg. ionenes, could present an alternative to conventional antibiotics. However, these are also primarily membrane-targeting agents, potentially vulnerable to the emergence of bacterial resistance similarly to colistin or daptomycin. The mechanism of resistance to membrane-targeting antimicrobials is not yet fully understood. Thus, it is important to understand how bacterial membrane lipid content alterations affect the susceptibility of bacteria and what can influence or induce them.



This diploma thesis will focus on developing and applying a chromatographic method of phospholipid content analysis and assessing, as well as monitoring, the stability of changes to the composition of bacterial membranes.

### **The proposed thesis project consists of:**

1. Literature review on bacterial membranes, their role in resistance and methods used in phospholipid analysis.
2. Development of a analysis method for polar lipids.
3. Assessment of changes in bacterial membrane lipid composition in chosen bacterial cultures under different conditions.